IN THE CLAIMS:

Please **ADD** claims 36 and 37, and **AMEND** claims 6, 8, 11, 19, 22, 23, 24, 26, and 35, as follows:

6. (ONCE AMENDED) A catadioptric projection optical system for projecting an image of a pattern of a first surface onto a second surface, comprising:

a first image-forming optical system for forming an intermediate image of the pattern of said first surface, and

a second image-forming optical system for forming an image of said intermediate image on said second surface,

wherein said first image-forming optical system includes:

a first group with a positive refractive power, comprising a refractive lens component, for converging a light beam from the pattern of said first surface;

a beam splitter for separating a part of a light beam from said first group by a beam-splitter surface arranged obliquely to an optical axis of said first group, said beam splitter disposed on the optical axis of said first group; and

a second group with a positive refractive power, comprising a concave, reflective mirror for reflecting the light beam separated by said beam splitter, for forming said intermediate image of the pattern between the concave, reflective mirror and the second image-forming optical system, said beam splitter provided between said concave, reflective mirror and said second image forming optical system.

8. (ONCE AMENDED) A catadioptric projection optical system according to claim 6, wherein

the following conditions are satisfied:

$$p_1+p_3>0,\ p_2<0,\ \text{and}\ |p_1+p_2+p_3|<0.1,$$

where p_1, p_2, and p_3 are individual Petzval's sums of said first group, second group, and second image-forming optical system; and

wherein the following conditions are satisfied:

$$0.1<|\beta_{12}|<0.5\ \text{and}\ 0.25<|\beta_3|<2,$$

where β_{12} is a magnification [of] from the pattern on said first surface to said intermediate image and β_3 is a magnification [of] from said intermediate image to said image on the second surface.

11. (ONCE AMENDED) A catadioptric projection optical system according to claim 10, wherein
the following conditions are satisfied:

$$p_1+p_3>0,\ p_2<0,\ \text{and}\ |p_1+p_2+p_3|<0.1,$$

where p_1, p_2, and p_3 are individual Petzval's sums of said first group, second group, and second image-forming optical system; and
wherein the following conditions are satisfied:

$$0.1<|\beta_{12}|<0.5\ \text{and}\ 0.25<|\beta_3|<2,$$

where β_{12} is a magnification [of] from the pattern on said first surface to said intermediate image and β_3 is a magnification [of] from said intermediate image to said image on the second surface.

19. (ONCE AMENDED) An exposure apparatus according to claim 17, wherein the following conditions are satisfied:

$$p_1+p_3>0,\ p_2<0,\ \text{and}\ |p_1+p_2+p_3|<0.1,$$

where p_1, p_2, and p_3 are individual Petzval's sums of said first group, second group, and second image-forming optical system; and
wherein the following conditions are satisfied:

$$0.1<|\beta_{12}|<0.5\ \text{and}\ 0.25<|\beta_3|<2,$$

where β_{12} is a magnification [of] from the pattern on said first surface to said intermediate image and β_3 is a magnification [of] from said intermediate image to said image on the second surface.

22. (ONCE AMENDED) An exposure apparatus according to claim 21, wherein

the following conditions are satisfied:

$$p_1+p_3>0,\ p_2<0,\ \text{and}\ |p_1+p_2+p_3|<0.1,$$

where p_1, p_2, and p_3 are individual Petzval's sums of said first group, second group, and second image-forming optical system; and

wherein the following conditions are satisfied:

$$0.1<|\beta_{12}|<0.5\ \text{and}\ 0.25<|\beta_3|<2,$$

where β_{12} is a magnification [of] from the pattern on said first surface to said intermediate image and β_3 is a magnification [of] from said intermediate image to said image on the second surface.

23. (TWICE AMENDED) A catadioptric projection optical system for projecting an image of a pattern of a first surface onto a second surface, said catadioptric projection optical system comprising:

a first image-forming optical system[,];

a second image-forming optical system[,];

and a partial mirror,

wherein

said first image-forming optical system includes[:]

a first group with a positive refractive power, said first group comprising a refractive lens component; and

a second group with a [negative] positive refractive power, said second group comprising a concave, reflective mirror,

said second image-forming optical system comprises a dioptric imaging system which includes a refractive lens component and an aperture stop,

light from said first surface passes through in order said first group, said second group, said partial mirror, and said second image-forming optical system and thereafter said light reaches said second surface,

said partial mirror is positioned so as to avoid disposing on an optical path of light that travels from said first group to said second group and is disposed on an optical path of light that travels from said second group to said second image-forming optical system, [and]

an intermediate image of said pattern of said first surface is formed at a predetermined

position of said optical path of light that travels from said second group to said second image-forming optical system, and

the dioptric imaging system of said second image-forming optical system extends from the intermediate image of said pattern to a second image formed by said second image-forming optical system at said second surface.

24. (ONCE AMENDED) A catadioptric projection optical system according to claim 23, wherein

the following conditions are satisfied:

$$p_1+p_3>0,\ p_2<0,\ \text{and}\ |p_1+p_2+p_3|<0.1,$$

where p_1, p_2, and p_3 are individual Petzval's sums of said first group, second group, and second image-forming optical system; and

wherein the following conditions are satisfied:

$$0.1<|\beta_{12}|<0.5\ \text{and}\ 0.25<|\beta_3|<2,$$

where β_{12} is a magnification [of] from the pattern on said first surface to said intermediate image and β_3 is a magnification [of] from said intermediate image to said image on the second surface.

26. (ONCE AMENDED) A catadioptric imaging optical system used in a projection exposure apparatus that transfers a pattern on a mask onto a substrate, comprising:

a first imaging optical sub-system arranged in an optical path between the mask and the substrate, said first imaging optical sub-system comprising

a first group with a lens, and

a second group with a concave mirror,

wherein said first imaging optical sub-system forms an intermediate image of the pattern;

a second imaging optical sub-system arranged in an optical path between said first imaging optical sub-system and the substrate, wherein said second imaging optical sub-system forms an image of the intermediate image on the substrate and comprises a dioptric imaging system which extends from the intermediate image to the image of the intermediate image; and

an optical path deflecting member arranged between said first group and said second group

of said first imaging optical sub-system, wherein said optical path deflecting member changes a direction of either a light beam from said first group or a light beam reflected by the concave mirror.

35. (ONCE AMENDED) A method of imaging a pattern on a mask onto a substrate, comprising:

guiding a light from the mask to a first group, wherein the first group comprises a lens;

guiding the light from the first group to a second group, wherein the second group comprises a concave mirror;

forming an intermediate image of the pattern based on the light from the second group;

guiding the light from the intermediate image to a dioptric imaging sub-system;

forming an image of the intermediate image on the substrate based on the light from the dioptric imaging sub-system, the dioptric imaging sub-system extending from the intermediate image to the formed image of the intermediate image; and

changing a direction of either the light beam from the first group or the light beam reflected by the concave mirror, in a space between the first group and the second group.

36. (NEW) A catadioptric imaging optical system used in a projection exposure apparatus that transfers a pattern on a mask onto a substrate, comprising:

a first imaging optical sub-system arranged in an optical path between the mask and the substrate, said first imaging optical sub-system comprising

a first group with a lens, and

a second group with a concave mirror,

wherein said first imaging optical sub-system forms an intermediate image of the pattern;

a second imaging optical sub-system arranged in an optical path between said first imaging optical sub-system and the substrate, wherein said second imaging optical sub-system forms an image of the intermediate image on the substrate; and

an optical path deflecting member arranged between said first group and said second group of said first imaging optical sub-system, wherein said optical path deflecting member changes a direction of either a light beam from said first group or a light beam reflected by the concave mirror,

wherein the following conditions are satisfied:

$p_1+p_3>0$,

$|p_1+p_2+p_3|<0.2$,

$0.1<|\beta_{12}|<0.5$, and

$0.25<|\beta_3|<2$,

where

p_1, p_2 and p_3 are individual Petzval's sums of said first group, said second group, and said second imaging optical system,

β_{12} is a magnification of an optical system positioned in an optical path from the mask to the intermediate image, and

β_3 is a magnification of an optical system positioned in an optical path from the intermediate image to the substrate.

37. (NEW) A catadioptric imaging optical system used in a projection exposure apparatus that transfers a pattern on a mask onto a substrate, comprising:

a first imaging optical sub-system arranged in an optical path between the mask and the substrate, said first imaging optical sub-system comprising

a first group with a lens, and

a second group with a concave mirror,

wherein said first imaging optical sub-system forms an intermediate image of the pattern;

a second imaging optical sub-system arranged in an optical path between said first imaging optical sub-system and the substrate, wherein said second imaging optical sub-system forms an image of the intermediate image on the substrate; and

an optical path deflecting member arranged between said first group and said second group of said first imaging optical sub-system, wherein said optical path deflecting member changes a direction of either a light beam from said first group or a light beam reflected by the concave mirror,

wherein

said second imaging sub-system comprises an optical axis along a straight line,

said first group has a positive refractive power and said second group has a positive power, and

the reticle and the substrate are scanned at different speeds corresponding to the magnification of said catadioptric imaging optical system.